Remarks

The office action dated December 17, 2002 has been carefully considered. It is believed that the following comments represent a complete response to the Examiner's rejections and place the present application in condition for allowance. Reconsideration is respectfully requested.

35 USC §112, Second Paragraph

The Examiner has objected to claim 25 under 35 USC §112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In response, claim 25 has been amended in order to be a proper Markush claim.

In view of the foregoing, we respectfully request that the objections to the claim under 35 USC §112, second paragraph be withdrawn.

35 USC §102

The Examiner has objected to claims 17, 20 and 24 as being anticipated by Ledoux (EP 241,963), and claims 17-18, 20 and 23-24 as being anticipated by Upjohn (WO 91/13993) under 35 USC §102(b). We respectfully disagree with the Examiner for the reasons that follow.

The claims under objection relate to plant seeds comprising a recombinantly expressed somatotropin. Applicants submit that prior to the present invention, no one was able to produce somatotropin in seeds. At the time of the invention, a significant technical problem existed with respect to achieving accumulation of somatotropins in plant seeds. While the prior art cited by the Examiner suggests the expression of somatotropin in plant seeds, thus clearly underscoring a need of achieving expression of somatotropin in seeds, none of the prior art was able to achieve expression of somatotropin in seeds. A finding of anticipation requires that the prior art places the invention in the possession of the public by providing an enabling disclosure of how to make the claimed subject matter (see *Scripps Clinic & Research*

Foundation v. Genentech Inc. 18 USPQ 2d 1001). Applicants respectfully submit that none of the references cited by the Examiner would enable the preparation of somatotropin in seed and therefore they cannot be said to anticipate the claims. Each of the cited references are described in turn below.

Ledoux et al. teaches a protocol for the transformation of barley with human growth hormone. All of the examples in Ledoux are hypothetical and Applicant respectfully submits that Ledoux is not enabling as it is extremely unlikely that the suggested methodology will provide plant seeds comprising growth hormone for the following reasons. In accordance with the Ledoux disclosure, it is suggested that certain plasmids are introduced into barley cells by soaking grains, spores or embryos in a solution containing such plasmids. Applicants submit that by following the methodology of Ledoux such plasmids will not be acquired by other plant cells when the plant cells are regenerated into full plants. In addition Ledoux suggests the use of *E. coli* type plasmids which would not be expected to be capable of the production of any recombinant polypeptide in a plant cell, as the requisite ancillary complement of molecular components (e.g. transcription factors, tRNAs etc) available in a plant cells are not compatible with a bacterial plasmid. Thus Ledoux underscores the desirability of achieving expression of somatotropin in plant seeds but provides no enabling disclosure of how to do so.

Upjohn teaches plant transformation vectors which may be used for the expression of somatotropin. The plant transformation vectors may contain a promoter region and other regulatory elements, for example a termination region, derived from a seed storage protein, such as phaseolin or zein. However Applicant disagrees with the Examiner that Upjohn teaches the use of a fusion protein with a seed storage protein. The individual passages referred to by the Examiner in the Office Action do not appear to suggest that the mature coding sequence of a seed storage protein, other than those amino acids deemed necessary for cleavage of the storage protein signal peptide, is used to prepare the expression constructs. Upjohn thus does not enable the accumulation of somatotropin in plant seeds. It should be noted that Upjohn does

not provide any data demonstrating that expression of somatotropin in seeds can indeed be obtained. In light of Bosch et al. (discussed under 35 USC §103 below), Applicant respectfully submits it is questionable as to whether in accordance with the methodology taught by Upjohn seeds comprising somatotropin may be obtained.

In view of the foregoing, we respectfully request that the objections to the claims under 35 USC §102(b) be withdrawn.

35 USC §103

The Examiner has objected to the claims 17-18, 20 and 23-25 under 35 USC §103(a) as being unpatentable over Upjohn (WO 91/13993) in view of Vandekerckhove et al. We respectfully disagree with the Examiner for the reasons that follow.

Our comments on Upjohn appear above. The deficiencies in Upjohn are not remedied by Vandekerckhove. Vandekerckhove teaches the expression of an enkephalin as a fusion protein with a 2S seed storage protein. There is no mention of somatotropin and there is no reason for a person of ordinary skill in the art to expect that the problems existing at the time of the invention with achieving accumulation of somatotropin in plant seeds would be overcome by following the teachings of Vandekerckhove. It should also be noted in this regard that Vandekerckhove's motivation for preparing fusion protein appears to be to minimally deviate from the native plant protein profile (page 929 2nd column).

Applicant wishes to draw the Examiner's attention to Bosch et al. that was submitted with the Information Disclosure Statement (Transgenic Research (1994) 3:304-310). Bosch, which significantly postdates the prior art cited by the Examiner, evaluates expression of somatotropin in plants and provides the only data available in the prior art. It was found that while somatotropin could be demonstrated in various plant tissues, somatotropin could not be detected in seed (see page 308, bottom of second column). Thus Bosch corroborates Applicant's assertion that somatotropin expression in seeds was not realized prior to the present invention.

In view of the foregoing, we respectfully request that the objections to the claims under 35 USC §103(a) be withdrawn.

The Commissioner is hereby authorized to charge any fee (including any claim fee) which may be required to our Deposit Account No. 02-2095.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made".

In view of the foregoing comments, we respectfully submit that the application is in order for allowance and early indication of that effect is respectfully requested. Should the Examiner deem it beneficial to discuss the application in greater detail, he is kindly requested to contact the undersigned by telephone at (416) 957-1682 at his convenience.

Respectfully submitted,

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Version with markings to show changes made

In the Claims:

Claim 25 has been amended as follows:

25. (Amended) A plant seed according to claim 18 wherein said plant seed is obtained from a plant selected from the group [of plants comprising] consisting of rapeseed (*Brassica spp.*), linseed/flax (*Linum usitatissimum*), safflower (*Carthamus tinctorius*), sunflower (*Helianthus annuus*), maize (*Zea mays*), soybean (*Glycine max*), mustard (*Brassica spp.* and *Sinapis alba*), crambe, (*Crambe abyssinica*), eruca (*Eruca sativa*), oil palm (*Elaeis guineeis*), cottonseed (*Gossypium spp.*), groundnut (*Arachis hypogaea*), coconut (*Cocus nucifera*), castor bean (*Ricinus communis*), coriander (*Coriandrum sativum*), squash, (*Cucurbita maxima*), Brazil nut (*Bertholletia excelsa*) and jojoba (*Simmondsia chinensis*).